

U.S.S.N. 09/303,791

- 4 -

G00263

REMARKS

Claims 1-4 and 8-13 are pending in the above application. Claim 11 stands objected to because of a typographical error identified on page 2 of the Office Action. Accordingly, claim 11 has been amended to correct the same.

Claims 1 and 3 stand rejected under 35 U.S.C. §102 as being anticipated by Renzo, U.S. Patent No. 5,308,284. Applicant respectfully submits that claims 1 and 3 are novel in view of the Renzo reference because each of the claims recites that the annular upturned member including the crimping lip be at the opposite end of the boot which includes the cylindrical neck member, which the Renzo reference does not teach or suggest. For at least this reason, claims 1 and 3 are novel notwithstanding the Renzo reference.

Claims 1, 2 and 8-10 also stand rejected under 35 U.S.C. §102 as being anticipated by Welschhof, U.S. Patent No. 4,747,805. Applicant respectfully traverses the rejection under §102 in view of Welschhof because the present claims and the prior art differ. In particular, independent claims 1 and 8 require that the claimed boot be a non-convoluted boot which the Welschhof reference does not disclose or suggest. Indeed, the only boot disclosed in the Welschhof reference includes a convoluted region generally identified by reference numeral 2 in the figures. In addition, independent claim 8 requires that the boot-can have a first end for mating with the outer race and a second flanged end spaced apart from the first end and the outer race which the Welschhof reference does not disclose or suggest. In particular, what is referred to as the boot-can of Welschhof in the Office Action, is identified by reference numeral 3. The portions of the metal cap 3 which are secured to the outer race and the boot are continuous and adjacent unlike the claimed arrangement of the boot-can of independent claim 8. For this additional reason, Applicant submits that claim 8 is novel and non-obvious in view of the Welschhof '805 reference.

U.S.S.N. 09/303,791

- 5 -

G00263

Claims 11-13 stand rejected under 35 U.S.C. §103 as being unpatentable over Moulinet, U.S. Patent No. 6,093,108 in view of Welschhof '805. According to the Office Action, Moulinet discloses all of the features of the claimed invention with the exception of the annular upturned edge having radially distributed apertures. Nevertheless, according to the Office Action, Welschhof '805 teaches an annular upturned edge having radially distributed apertures, thus, it would have been obvious to include the radially distributed apertures of Welschhof to the boot of Moulinet. The Moulinet reference discloses a bellows device including elastic bellows (19) connected to a shaft (9) at one end, and a rotary member (11) at the other end. The device includes a rigid ring member (21) for stabilizing the bellows (19) including a radially external connecting part adapted to ensure axial retention of the ring member relative to the second rotary member.

Applicant respectfully traverses the objection under §103 and submits that the combination of Moulinet and Welschhof would not render obvious Applicant's claimed invention because Moulinet or Welschhof '805, either alone or in combination, do not disclose or suggest a non-convoluted thermoplastic boot as claimed in claims 11-13. The boot-like devices of Moulinet and Welschhof both include corrugated sections or convoluted portions to permit articulation of the boot with respect to the assembly.

With regard to the thermoplastic limitation of claim 11, the Moulinet reference only refers to the bellows (19) as "elastic" bellows. This is consistent with rubber or silicone materials typically used in such applications. In contrast, thermoplastic elastomers such as claimed in the present invention provide for a more firm or harder boot than rubber or silicone materials typically used. Thermoplastic elastomers thus provide additional stability and resistance to environmental contaminants and damage. Because thermoplastic materials are stiff and relatively non-compressible, however, the boot of the present invention includes cut-out regions 60 or 62 to reduce the effective stiffness of the thermoplastic material.

U.S.N. 09/303,791

- 6 -

G00263

In view of the teachings of the Moulinet reference, Applicant respectfully submits that there is no motivation to combine the Moulinet reference with the Welschof reference as proposed in the Office Action. In particular, the resiliency or elasticity of the boot 19 of Moulinet is a desired, or possibly necessary, feature. This is because the compressibility of the bead (27) is desirable such that the ring (21) can be retained by press-fitting into the free end (13) of the cover (11). If the boot (19) was a non-compressible thermoplastic, press-fitting and retaining the ring (21) would be more difficult. Furthermore, the purpose of the ring (21) in Moulinet is to prevent excessive creasing of the bellows (19) and to stabilize the bellows (19) in certain operating environments. A rigid thermoplastic boot in the arrangement of Moulinet would not provide the joint and shaft connection with the desired flexibility that an elastic boot such as the boot (19) disclosed therein would provide. Accordingly, for the foregoing reasons, Applicant submits that the Moulinet reference would not be modified absent some teaching or suggestion or motivation within the prior art references to include a substantially non-compressible thermoplastic boot.

Finally, with respect to claim 4, no rejection has been put forth in the Office Action. Claim 4 requires that the boot of claim 1 be formed of a thermoplastic material. Thus, even though no reasons have been stated for the rejection of claim 4, Applicant submits that claim 4 is novel and non-obvious for the same reason just stated with respect to the use of thermoplastics for the boot.

By this amendment, Applicant has also amended page 12 of the specification to correct a typographical error. Applicant submits that no new matter has been added.

U.S.S.N. 09/303,791

- 7 -

G00263

In view of the foregoing amendments and remarks, Applicant submits that claims 1-4 and 8-13 are allowable. Reconsideration of the application and a Notice of Allowance indicating the same is therefore respectfully solicited.

Respectfully Submitted,

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U.S.N. 09/303,791

- 8 -

G00263

VERSION WITH MARKINGS TO SHOW CHANGES MADE

In The Specification:

Please amend the first full paragraph on page 12 to read as follows:

Thus, the compressed crimping lip 51 thickness ratio is approximately 50% to 70% of the uncompressed crimping lip 51 thickness. The use of the cut-outs 60 or apertures 62 may reduce standard crimping force required by up to approximately 50%. In this manner, the modified geometry has reduced effective stiffness, allowing for a greater degree of compression of the boot-can 40 to boot 30. A thermoplastic elastomer rolling diaphragm boot 38, 38' of this type further includes a better seal integrity over ~~[operative its]~~ its operative lifetime, and particularly, during cold temperature operation.

In The Claims:

Please amend claims 1, 8 and 11 to appear as follows:

1. (Twice Amended) A constant velocity universal joint boot comprising:

at one end, a cylindrical neck member for receiving a shaft; and

at the other end, an annular upturned member [having] defining a longitudinal axis and including a crimping lip, said crimping lip having a plurality of radially distributed apertures which are oriented parallel to said longitudinal axis for reducing the stiffness and increasing

U.S.S.N. 09/303,791

- 9 -

G00263

the compressibility of said crimping lip, wherein said boot is non-convoluted.

8. (Twice Amended) A constant velocity universal joint assembly comprising:

a constant velocity universal joint having an outer race;

a boot-can having a first end for mating with said outer race annular housing and a second flanged end spaced apart from said first end and said outer race; and

a non-convoluted thermoplastic rolling-diaphragm boot having a crimping lip received by the second flanged end of said boot-can, the crimping lip having a plurality of radially distributed apertures for increasing the compressibility of the crimping lip.

11. (Amended) A constant velocity universal joint and propeller shaft assembly comprising:

a propeller shaft having a first end;

a constant velocity universal joint for receiving the first end of the propeller shaft and including an outer race having a first face;

a boot-can having a large-diameter end and a smaller-diameter flanged end, the larger-diameter end for mating with the first face of the outer race; and

a non-convoluted thermoplastic boot having a sealing end, a tubular stem portion for receiving the propeller shaft, and an annular upturned edge crimpingly affixed to the

U.S.S.N. 09/303,791

- 10 -

G00263

smaller-diameter flanged end of the boot-can, the annular upturned edge having a plurality of radially distributed apertures for increasing the compressibility of the annular upturned edge, and the sealing end cooperating with the propeller shaft to provide a seal therewith.